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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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STEVEN WESEMAN ASSOCIATE GENERAL COUNSEL, I.P. CABOT MICROELECTRONICS CORPORATION 870 NORTH COMMONS DRIVE AURORA, IL 60504			FULK, STEVEN J	
			ART UNIT	PAPER NUMBER
			2891	

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,167

Applicant(s)

BUSTA, HEINZ H.

Examiner

Steven J. Fulk

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6, 10-40 and 42-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 10-39, 42-55 and 57 is/are rejected.
- 7) ☒ Claim(s) 40 and 56 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed April 28, 2006, which amends claims 1, 6, 32, 36 and 39 and cancels claims 4, 5, 7, 8 and 41, has been entered. Claims 1-3, 6, 10-40, and 42-57 are currently pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 28 recites the limitations "lever mechanism" and "third contact region". There is insufficient antecedent basis for "lever mechanism" and "third contact region" in the either claim 28 or independent claim 11. The limitation apparently should read "movable mechanism" and "second contact region", as recited in claim 11.

4. Claim 42 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 42 is dependent on canceled claim 41, and is therefore indefinite. Claim 42 apparently should depend from claim 39.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 11, 13-19 and 27-28 are rejected under 35 U.S.C. 102(b) as being anticipated by De Los Santos et al. '611.

Regarding claims 11, 13-16 and 27, De Los Santos et al. discloses a MEM device comprising a moveable mechanism (fig. 2, 28) residing adjacent a substrate (22); an abrasion resistant material localized on a first portion of the movable mechanism (30b; col. 6, lines 62-65; contact contains TiW, an art recognized abrasion resistant material); a first contact region localized on the substrate that attracts the moveable mechanism toward the substrate (40b) such that the abrasion resistant material becomes operationally coupled to a second contact region (24b) comprising an abrasion resistive material that resides on the substrate, wherein the second contact material is similar to the first portion material (24b also contains TiW; col. 5, lines 24-26). It is inherent that the first portion of the mechanism would be subject to abrasion as the first portion of the mechanism becomes operationally coupled to the second contact region.

Regarding claims 17-18, the reference discloses the second contact region to comprise a first RF contact portion and a second RF contact portion, such that the movable mechanism shorts the first and second RF contacts (fig. 7, 24b; RF IN &

OUT); and a third contact region operable to pull back the moveable mechanism from being attracted to the second contact region (fig. 2, 38a).

Regarding claim 19, the reference further discloses the moveable mechanism to comprise a first anchor portion (fig. 2, 34) and a second anchor portion (32) integral to a top surface of the substrate.

Regarding claim 28 and insofar as definite, the reference further discloses a dielectric layer (fig. 17, 64) deposited along the surface of the substrate such that when the first contact region is energized, the moveable mechanism (60) is not physically coupled to the second contact region (64 covers second contact 54 from being engaged with mechanism 60).

6. Insofar as definite, claims 39, 42-50, 52-55 and 57 are rejected under 35 U.S.C. 102(e) as being anticipated by Ruan et al. '602.

a. Regarding claims 39, 48 and 50, Ruan et al. discloses an integral micro-machined structure (fig. 5) for enclosing a MEM device (112) comprising a structure (512) extending from a substrate (102) and enclosing the MEM device; and a cover structure extending on a portion of the substrate structure (506), a contact region (508) provided on the cover substrate structure and acting as a pull-back contact for a MEM device residing on the substrate, wherein the micro-machined structure defines a tortuous, labyrinth path (114; fig 1B, 114 is shown to have a labyrinth channel structure).

b. Regarding claim 42, the reference discloses a shielding member which prevents passage of electromagnetic radiation(504/506;insulating substrate).

- c. Regarding claim 43, the reference discloses a sealing member that engages the tortuous path and seals the enclosure (506 seals enclosure 116 and engages tortuous channel 114).
- d. Regarding claims 44-47, the reference discloses an inert, arch preventing gas (air) or vacuum provided in the sealed enclosure (col. 4, lines 26-30).
- e. Regarding claim 49, the reference discloses a second MEM enclosed by the micro-machined structure (arrays of devices are formed; col. 3, lines 2-4).
- f. Regarding claims 52-54 and 57, Ruan et al. discloses a method of fabricating a micro-machined structure for enclosing a MEM device (fig. 5, 112) comprising providing a substrate (fig. 5, 102); fabricating a vertical substrate structure (512) extending from the substrate; and fabricating a cover substrate structure (506) residing on a portion of the substrate structure and defining a tortuous, labyrinth channel (114; fig 1B, 114 is shown to have a labyrinth channel structure).
- g. Regarding claim 55, the reference discloses the step of enclosing a plurality of MEM devices in the micro-machined apparatus (arrays of devices are formed; col. 3, lines 2-4).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject

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matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daneman et al. '887 in view of Lin et al. (NPL Reference "U", previously provided).

Daneman et al. discloses a MEM device comprising a movable micro-machined structure comprising a lever mechanism (fig. 9A, 911), with a conductive diamond material defining an abrasion resistive contact area (diamond is art recognized as the hardest material on Mohs scale, and therefore an inherent abrasion resistive material) disposed along a surface of the structure (922-928; col. 11, lines 12-17). The reference also discloses the device to operate as a switch or relay (col. 1, lines 35-38; optical switch that relays signals from one fiber to another); and the invention to further comprise an integral enclosure that encloses the movable micro-machined structure (fig. 10A-10F, insulating layer 1010 and conductive layer 1014 enclose device layer 1002). The device is inherently subject to abrasion as it closes.

Daneman et al. does not disclose the movable lever mechanism to comprise a rib enforced lever mechanism. Lin et al. discloses a movable micro-machined structure comprising a rib enforced lever mechanism (fig. 1; page 93-95, section 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rib enforced lever of Lin et al. in the switch mechanism of Daneman et al. One would have been motivated to do this because

Lin et al. taught that the standard levers used to support mirrors in optoelectronic switches, such as the switch of Daneman et al. (fig. 9A, 913), become deformed under electrostatic forces, and using a rib enforced lever reduces this deformation (Lin et al., page 93, section 1), thus extending the lifetime of the device.

9. Claims 12 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Los Santos et al. '611 in view of Daneman et al. '887.

a. Regarding claim 12, De Los Santos et al. discloses all of the elements of the claim as set forth above in paragraph 5, including an abrasion resistant material on a first portion of the moveable mechanism, but the reference does not explicitly teach the use of a diamond material as an abrasion resistant material. Daneman et al. teaches a MEM device comprising a movable mechanism with a diamond material on a first portion of the moveable mechanism (fig. 9A; col. 11, lines 12-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diamond material of Daneman et al. in the MEM device of De Los Santos et al. One would have been motivated to do this because diamond was well known in the art as the hardest material on Mohs scale, and thus would have improved the abrasion resistance of the contact and extended the lifetime of the device.

b. Regarding claim 37, De Los Santos et al. discloses all of the elements of the claim as set forth above in paragraph 5, but the reference does not explicitly teach an integral enclosure that encloses the MEM device.

Daneman et al. teaches a MEM device comprising a movable micro-machined

structure with an integral enclosure that electrically shields and encloses the MEM device (fig. 10A-10F, electrically shielding insulating layer 1010 and conductive layer 1014 enclose device layer 1002).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the integral enclosure of Daneman et al. in the device of De Los Santos et al. One would have been motivated to do this because it was well known in the art that the insulating enclosure would have both reduced the switch's susceptibility to electrical noise and protected it from environmental conditions, such as moisture and contamination, thus improving the performance of the device.

10. Claims 20-23, 29-31, 34-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Los Santos et al. '611 in view of Lin et al. (NPL Reference "U"). The process limitations of planarization found in claims 22, 23 and 36 invoke the product-by-process doctrine. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps (*MPEP* § 2113). For example, anticipation of claims 22, 23 and 36 does not require the surface to be processed using a CMP step; anticipation only requires that the layer has a planar surface.

De Los Santos et al. discloses all of the elements of the claims as set forth in paragraph 5 above, including a planar metallic (conductive composition) surface (fig. 2, contact 30b) and first and second micro-strip contact lines (fig. 7, 24b; RF IN & OUT), but the reference does not disclose the surface to define an integral rib.

Lin et al. discloses a movable mechanism with a second surface defining an integral rib. (fig. 1; page 93-95, section 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rib enforced mechanism of Lin et al. in the switch mechanism of De Los Santos et al. One would have been motivated to do this because Lin et al. taught that the standard levers used in switches become deformed under electrostatic forces, such as the forces applied by De Los Santos to operate the switch (col. 4, lines 41-47), and using a rib enforced lever reduces this deformation, thus improving the performance of the device (Lin et al., page 93, section 1).

11. Claims 24-26 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Los Santos et al. '611 in view of Lin et al. (NPL Reference "U"), and further in view of Daneman et al. '887.

a. Regarding claims 24-26, De Los Santos et al. in view of Lin et al. teaches all of the elements of the claims as set forth in paragraph 9 above, including a pull-back contact on the substrate of the device (fig. 2, 38a), but the references do not explicitly teach an integral enclosure that electrically shields and encloses the MEM device. Daneman et al. teaches a MEM device comprising a movable micro-machined structure with an integral enclosure that electrically shields and encloses the MEM device (fig. 10A-10F, electrically shielding insulating layer 1010 and conductive layer 1014 enclose device layer 1002).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the integral enclosure of Daneman et al. in the device as described by De Los Santos et al. in view of Lin et al. One would have been motivated to do this because it was well known in the art that the insulating enclosure would have both reduced the switch's susceptibility to electrical noise and protected it from environmental conditions, such as moisture and contamination, thus improving the performance of the device.

b. Regarding claim 33, De Los Santos et al. in view of Lin et al. teaches all of the elements of the claims as set forth in paragraph 9 above, including a conductive layer, but the references do not teach the conductive layer to comprise diamond. Daneman et al. teaches a MEM device comprising a movable mechanism with a conductive diamond material on the mechanism (fig. 9A; col. 11, lines 12-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diamond material of Daneman et al. in the MEM device as described by De Los Santos et al. in view of Lin et al. One would have been motivated to do this because diamond was well known in the art as the hardest material on Mohs scale, and thus would have improved the abrasion resistance of the contact and extended the lifetime of the device.

12. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Los Santos et al. '611 in view of Lin et al. (NPL Reference "U"), and further in view of Ruan et al. '880.

De Los Santos et al. in view of Lin et al. teaches all of the elements of the claims as set forth in paragraph 9 above, including a conductive layer, but the references do not teach the conductive layer to comprise copper. Ruan et al. teaches a MEM device comprising a movable mechanism with a conductive copper material on the mechanism (fig. 1A, 120; ¶26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the copper material of Ruan et al. in the MEM device as described by De Los Santos et al. in view of Lin et al. One would have been motivated to do this because Ruan et al. taught that copper was an art recognized functional equivalent to the gold containing conductive layer of De Los Santos et al. (Ruan et al., ¶26)

13. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruan et al. '602 in view of Clevenger et al. '526.

Ruan et al. discloses all of the elements of the claim as set forth in paragraph 6 above, but the reference does not explicitly teach the structure for enclosing the device to comprise diamond. Clevenger et al. teaches a method of forming a microelectronic device having an enclosing cap comprising diamond (fig. 9, 19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diamond material of Clevenger et al. in the

enclosing cap of Ruan et al. One would have been motivated to do this because a diamond cap would have provided improved thermal conductivity over the material of Ruan et al. (Clevenger et al., ¶43), thus allowing heat generated by the device to dissipate thereby increasing the lifetime of the device.

Response to Arguments

14. Applicant's arguments, see page 7, with respect to the rejection of claim 36 under 35 U.S.C. 112, 2nd paragraph, have been fully considered and are persuasive. The rejection of claim 36 under 35 U.S.C. 112, 2nd paragraph has been withdrawn.
15. Applicant's arguments, see pages 7-8, with respect to the rejection of claims 1-4 and 10 under 35 U.S.C. 102(e) have been considered but are moot in view of the new ground(s) of rejection as set forth in paragraph 8 above.
16. Applicant's arguments, see pages 8-9, with respect to the rejection of claims 11, 13-19 and 27-28 under 35 U.S.C. 102(b) as anticipated by De Los Santos et al. have been fully considered but they are not persuasive. Applicant argues that De Los Santos et al. does not teach an abrasion resistant material located on a first portion of a movable mechanism. However, as stated in paragraph 5 above, De Los Santos et al. teaches the material located on the first portion of the movable mechanism to comprise TiW, which is an art recognized abrasion resistant material and thus anticipates the claims. The fact that controlling the rate of the switching action and speed of contact between interconnection lines is not taught by De Los Santos et al. is irrelevant because these features are not recited in the rejected claim(s). Although the claims are interpreted in light of

the specification, limitations from the specification are not read into the claims.

See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

17. Applicant's arguments, see page 9, with respect to the rejection of claim 37 under 35 U.S.C. 102(b) have been considered but are moot in view of the new ground(s) of rejection as set forth in paragraph 9b above.
18. Applicant's arguments, see pages 9-10, with respect to the rejection of claims 39, 42-50, 52-55 and 57 under 35 U.S.C. 102(b) have been fully considered but are moot in view of the new ground(s) of rejection as set forth in paragraph 6 above.
19. Applicant's arguments, see pages 9-10, with respect to the rejection of claims 40 and 56 under 35 U.S.C. 102(b) have been fully considered and are persuasive. The rejection of claims 40 and 56 has been withdrawn.
20. Applicant's arguments, see page 10, with respect to the combination of Daneman et al. in view of Lin et al., as applied to claims 1-3, 6 and 10 in paragraph 8 above, have been fully considered but they are not persuasive. Applicant argues that the movable mechanism of Daneman et al. is a flap, and not a lever. This argument is not persuasive because the mechanism of Daneman et al. (fig. 9, 911) is clearly the electrically actuated arm of an optical switch (col. 9, lines 48-59; col. 1, lines 35-52), and thus performs as a rigid bar to turn the switch on and off. The terminology used by Daneman et al. is irrelevant, as the arm reads on the broad term "lever".

Applicant also argues that there is no motivation to combine the references. The examiner recognizes that obviousness can only be established

by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to use the rib enforced mechanism of Lin et al. in the switch mechanism of De Los Santos et al was taught by Lin et al. Specifically, one would have been motivated to do this because Lin et al. taught that the standard levers used in switches become deformed under electrostatic forces, such as the forces applied by De Los Santos to operate the switch (col. 4, lines 41-47), and using a rib enforced lever reduces this deformation, thus improving the performance of the device (Lin et al., page 93, section 1).

21. Applicant's arguments, see page 11, with respect to the rejection of claims 6-8 under 35 U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection as set forth in paragraph 8 above.
22. Applicant's arguments, see pages 11-12, with respect to the rejection of claim 12 under 35 U.S.C 103(a) as being unpatentable over De Los Santos et al. in view of Daneman et al. have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation

to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to use the diamond material of Daneman et al. in the MEM device of De Los Santos et al. was in the knowledge generally available to one of ordinary skill in the art. Specifically, one would have been motivated to do this because diamond was well known in the art as the hardest material on Mohs scale, and thus would have improved the abrasion resistance of the contact and extended the lifetime of the device.

23. Applicant's arguments, see pages 12-13, with respect to the rejection of claims 20-23, 29-31, 34-36 and 38 under 35 U.S.C 103(a) as being unpatentable over De Los Santos et al. in view of Lin et al. have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to use the rib enforced mechanism of Lin et al. in the switch mechanism of De Los Santos et al was taught by Lin et al. Specifically, one would have been motivated to do this because Lin et al. taught that the

standard levers used in switches become deformed under electrostatic forces, such as the forces applied by De Los Santos to operate the switch (col. 4, lines 41-47), and using a rib enforced lever reduces this deformation, thus improving the performance of the device (Lin et al., page 93, section 1).

24. Applicant's arguments, see pages 13-14, with respect to the rejection of claims 24-26 and 32 under 35 U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection as set forth in paragraphs 11 and 12 above.
25. Applicant's arguments, see page 14, with respect to the rejection of claim 33 under 35 U.S.C 103(a) as being unpatentable over De Los Santos et al. in view of Lin et al. and further in view of Daneman et al. have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to use the diamond material of Daneman et al. in the MEM device of as described by De Los Santos et al. in view of Lin et al. was in the knowledge generally available to one of ordinary skill in the art. Specifically, one would have been motivated to do this because diamond was well known in the art as the hardest material on

Mohs scale, and thus would have improved the abrasion resistance of the contact and extended the lifetime of the device.

26. Applicant's arguments, see pages 15-16, with respect to the rejection of claim 51 under 35 U.S.C. 103(a) have been fully considered but are moot in view of the new ground(s) of rejection as set forth in paragraph 13 above.

Allowable Subject Matter

27. Claims 40 and 56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
28. The following is a statement of reasons for the indication of allowable subject matter: a reasonable search of the prior art did not find a micro-machined structure and a method of fabricating the structure, wherein a cover structure resides over the MEM device substrate having a tortuous channel, and wherein the channel provides a path for removal of material internal to the enclosure, as recited in claims 40 and 56.

Ruan et al. '602 discloses a MEM switch device that is enclosed by a cover having a tortuous channel, but the channel is filled by an interconnect line and is not provided to remove material internal to the enclosure.

Nelson '215 discloses a MEM switch device having a rib enforced lever, but the device is not enclosed by a cover substrate.

Berenz et al. '540, Daneman et al. '887, De Los Santos et al. '611 and Ruan et al. '880 disclose a MEM switch device, but the device is not enclosed by a cover substrate.

Sassolini et al. '773 and Mastromatteo et al. '053 disclose a MEM switch device having a tortuous channel, but the device is not enclosed by a cover substrate.

Carley '812, Reichenbach et al. '902, Huang et al. '353, Tilmans et al. '072 and Martin et al. '280 disclose a MEM device that is enclosed by a cover substrate, but the cover substrate does not have a tortuous channel providing a path for removal of material internal to the enclosure.

Conclusion

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Steven J. Fulk
Patent Examiner
Art Unit 2891



BRADLEY K. SMITH
PRIMARY EXAMINER

June 30, 2006